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INDIA CONTEMPLATES THE BOMB

It is now dubious that India will renounce nuclear weapons, and obvious that it will not sign the Non-Proliferation Treaty. Attention has been diverted from New Delhi's abstention, because other important states have also delayed signing or ratifying the treaty, which may be unfortunate. How long will India refrain from manufacturing a nuclear explosive? The list of arguments against an Indian atomic bomb is still long, but the weight of each item on the list may soon come into question.

Perhaps as significant as any consideration must be the actions of the United States and the USSR, the two super-powers that wrote NPT and so unsuccessfully urged India to sign it. To exert pressure for NPT, or against an Indian atomic bomb, the United States presumably had some leverage with its policies on foreign aid, in direct and indirect programs, as in the various World Bank decisions on non-project loan assistance. The USSR had similar options with its economic aid and military assistance programs, as well as its yearly U.N. votes on Security Council considerations of Kashmir. All such levers could have been arrayed to pressure India to sign NPT, but they were not. All these levers could still be arrayed to deter India from a bomb project, but probably will not be. The year 1968 saw the U.S. Congress reduce foreign aid regardless of India's stands on things nuclear, and it saw the USSR offer military equipment to India's worst enemy, Pakistan. The traumatic effect of the latter decision on Indian opinion has been severe. It dramatically re-inforced the determination of many Indians to become independent of all outside assistance, indifferent to any outside influence.

PACIFISM DECLINING

There are many other countries that presumably will be affronted by India's move to nuclear weaponry, for the outside world does not consist only of

How soon will India become the sixth nuclear power? India can now produce components on its own for the big Kalpakkam nuclear reactor in Madras, and the reactor can produce a significant quantity of plutonium. Public opinion polls reveal a drop in esteem for Gandhi's principles. The author is assistant professor of government at the Harvard University Center for International Affairs. Research for this article was supported by the American Philosophical Society and the Social Science Research Council.

super-powers. India's image of pacifism would be seriously damaged, the respect of many aligned and non-aligned nations lost. These arguments against nuclear weapons, or for NPT, have also lost much of their punch within India, however, ever since the Chinese incursions across the Himalayan frontier in 1962. Many Indians then learned the lesson that although the world professed to respect pacifism, it really respected strength. Recent public opinion polls show a dramatic drop in the esteem for Gandhi's principles (albeit not for Gandhi the man). Indians in any event are tired (rationally or irrationally) of being an object of other nations' sympathy, of visibly "needing help."

Aside from world opinion, India might show concern for the example she will set by moving to make a bomb, or indeed the example of her current refusal to sign NPT. Surely it is easier for South Africa or West Germany to dig in their heels against signing, when they can be certain that India will always be out in the cold with them. Surely India's procuring a bomb or explosive would make it easier for Israel or Brazil to defy the super-powers in a similar fashion. Yet, here again, one finds in India, as indeed in some other countries, a monumental indifference. When India becomes the sixth nuclear power, however, she

might begin to be concerned lest there be a seventh. Until then her more immediate considerations will outweigh any long-term bogey the super-powers might conjure up. Americans tell India to inhibit herself lest weapons spread to the Middle East; Russians similarly warn of proliferation to West Germany. Neither of these areas worry anyone in India at even the tertiary level.

A more direct argument against India having nuclear weapons alludes to Pakistan. It was clear in 1968 that Pakistan would sign NPT if and only if India did. If India moves to exercise its nuclear options, surely Pakistan will be desperately moved to seek the same options. Again, the argument fits into a list, but adds little to its weight. No one in India credits Pakistan with an indigenous nuclear option in the remotest future. If the only possible supplier of such weapons is China, it would be a great over-simplification to credit Indian moves with determining Peking's generosity in this field.

NEED FOR ASSISTANCE

Even without the threat of foreign economic retaliation in general, which would follow a decision to develop the bomb, India might still be averse to losing technical assistance specifically in the nuclear field. The letter of NPT certainly will require signatories to withhold any material assistance that might be used for weapons, indeed any assistance not subject to IAEA safeguards ensuring no military use. Thus, if other forms of outside assistance can not be orchestrated to encourage India to abstain from developing nuclear weapons, perhaps the very treaty that India has failed to sign can be a tool for co-ordinating the sources of nuclear technology in this direction.

A question remains, however, on how dependent India will continue to be on foreign expertise in this area, and how effectively NPT can function as an instrument of international embargo. If Indian authorities had really

felt so dependent on outside help, their rejection of NPT might have been less clear and less abrupt. The Indian nuclear program has come a long way since the 1950s. If Canadian and other outside assistance were essential to this program, it does not follow that it is essential to further progress.

The Indian government's desire for a sense of independence is further illustrated by its plans to construct almost immediately its fourth large power reactor at Kalpakkam in Madras, without commitments to any foreign state or agency for exclusively peaceful use. India can already produce a large percentage of the components for the Kalpakkam reactor, and Kalpakkam, in turn, could produce a significant quantity of plutonium, perhaps enough for 40 bombs a year.

The issue now arising is whether foreign suppliers can be persuaded to deliver the remaining few components needed without asking for IAEA safeguards. A straightforward interpretation of NPT might require all suppliers to withhold such equipment. Yet NPT does not come into effect until it has been ratified by 40 countries including the U.S. and USSR, and the bids on Kalpakkam are going out now. The nuclear field is rapidly becoming a buyer's rather than a seller's market, with Canada, the U.S., Sweden, West Germany, France and other countries all potential competitors. Thus, India may yet get all it needs without signing NPT, without accepting safeguards or offering assurances, without abstaining from the diversion of plutonium into explosives, peaceful or military.

ECONOMICS OF BOMB

When all predictions of external human behavior become uncertain or unconvincing, one usually turns in the end to the sounder and more material realm of economics. Throughout India, the ever reliable bulwark for those opposing nuclear options has been the argument of cost. That is, India simply could not afford to allocate large sums to a venture with so little practical return. If those who hold responsible positions within the Indian government continue to share this conclusion, and if those who are competent in accounting and systems analysis continue to remain level-headed, then

the world can perhaps relax its alarmed speculation about further proliferation, for India will be too sensible to exercise the option it refused to sign away in 1968. Yet the ramparts of sensible economic calculation are not so secure anymore. A number of very reputable Indian economists have begun telling the public that plutonium bombs will soon no longer be expensive. If any of their calculations are over-simplified for 1969, they may not be so for 1975 and perhaps not even so for earlier years.

As India very sensibly now begins a large-scale exploitation of nuclear energy for production of electricity, supplies of plutonium will come into being. The separation plant for the enrichment of such plutonium to weapons-grade fissionable material already exists. It is thus more and more difficult to claim that a Nagasaki-sized nuclear explosive, by itself, will be very costly for India by 1971 or 1972.

India's yearly defense budget runs in excess of one billion U.S. dollars; the current budget of the Indian Atomic Energy Department comes to almost 100 million. The 1968 Report of the U.N. Secretary General generally estimated the cost of a moderate program, intended to produce ten Nagasaki-sized bombs yearly, at less than 2 million dollars per warhead. It has even been suggested that this warhead estimate exaggerates the costs for an Indian project, now that streams of plutonium are circulating within the system, with a separation plant in operation. Cost estimates for an operational, latest-generation missile delivery system are another matter, of course, but there are persons in India who seriously wish to stop far short of this.

MILITARY VALUE

There never has been a weapon that someone could not speculatively find a use for. As many Western as Indian strategic writers have set themselves to composing scenarios in which an Indian bomb would be of great military value. Memories of 1962 conjure up hordes of Chinese Communist troops crossing the Himalayas, and perhaps "tactical" nuclear weapons could be used to repulse them. If the development of the small warheads for tactical situations were too costly, as there is a great difference between a crude Nagasaki-type plutonium bomb and the war-

head of a modern nuclear artillery shell, the cruder devices could still perhaps be used. They could be planted as nuclear land-mines in key valleys, the invasion routes to be detonated and only if, the aggressor's forces had filled the valleys.

Yet, memories of 1962 are misleading. The Indian army was unprepared for the Chinese attack and was nearly as strong in conventional terms as it is now. Furthermore, the Chinese had chosen to withdraw, in part because they would have soon been forced to withdraw. The logistic situation south of the Himalayas heavily favors India, just as the area to the north favors China, and transporting supplies across the mountains would not have been easy. By "voluntarily withdrawing" in 1962, the Chinese may have caused India as well as others to forget how defensible India even then by conventional arms alone. In short, a Western argument to the effect that India requires neither additional conventional nor nuclear forces to defend its northern frontiers but only what it already has.

CHINESE THREAT

Aside from tactical uses, the Chinese have nuclear weapons and could threaten explicitly to use them against Indian armed forces or cities. Perhaps Indian bombs would thus be valuable only to counter this threat, that is, to make it clear from the start that a Himalayan war would have to remain conventional because both sides could make it nuclear. Yet to be able to threaten Chinese cities may be a somewhat more costly proposition for India than simply assembling some plutonium bombs. China has air defenses, the aircraft currently available to the Indian Air Force or to Air India International can not be certainly counted upon to reach Shanghai or Peking. Missiles, and missile warheads, cost a great deal of money. No Indian should deny the danger of this is the price of full-fledged membership in the nuclear club. One can easily enough imagine India halting the club with a simple plutonium bomb and, then, feeling separately obligated to tidy up its membership, its "retaliatory second-strikes" with missiles and hydrogen bombs.

One should not however underestimate the military case for cheap

mium bombs. No anti-aircraft system is perfect. If France's entire Force de Frappé (some 40 aircraft) is launched against Soviet cities, it is statistically quite likely that at least one Russian city will be destroyed. Similarly, any Indian bomb stockpile, however crude the bombs and delivery systems, will force Chinese planners at least to contemplate a possibility that previously had not existed, losing a city to Indian retaliation.

A "NUCLEAR" UMBRELLA

The possibility of a severe American response probably already deters any Chinese use of nuclear weapons against Delhi, as well as against Tokyo, Bangkok or Sydney. Soviet responses also probably deter China. American and Russian assistance for India are extremely likely even in the event of a conventional attack. Indeed, Indian defense plans currently can be rationalized as assuming a great probability for such moral and material support from the outside world in the event of a Chinese attack.

Only the more polemical Indian statements deny this; yet only the more polemical Western statements claim that this sums up the issue. The existence of even a rudimentary Indian bomb stockpile will inevitably change the expectations of both sides to any new confrontation in the Himalayas, and the balance of this psychological change might yet favor India. If the introduction of the superpowers' nuclear arsenals on behalf of India were not plausible and salient enough in the minds of all the publics that matter, an Indian nuclear warhead would not be redundant. Any confrontation along a hostile frontier is somewhat a game of "chicken," a contest of whose resolve will come into question first. A visible addition of weapons of mass destruction to one side will not be without effect.

If India had never had occasion to inquire as to the specific extent of American or Soviet support, such support might always have seemed relatively obvious. Chinese initiatives, or proposals such as NPT, however induce attempts at explication which can be quite upsetting. Hence, when the Indian government in 1967 sent high-level missions to sound out Moscow and Washington on the nature of future guarantees, both super-



powers were far from definitive in the assurances offered. Since the likely enemy for India was still China, Moscow could hardly go as far as New Delhi would have desired. The United States now was also intent on "building bridges" to China, and on avoiding new exacerbations of the alledgedly basic Sino-American conflict, so that it was hardly the moment for a very explicit guarantee to India. An American aversion to new commit-

ments also has certainly emerged in the wake of the Vietnam war. The testimony of the former Secretary of State, Dean Rusk, to the U.S. Senate on behalf of NPT, circumscribing the implicit American commitments, did not make the treaty any more attractive for New Delhi. The joint U.S.-USSR-Great Britain statement suggesting immediate recourse to the processes of the U.N. Security Council, however intended, served similarly to convince many Indians that great-power guarantees were somewhat deceptive—Security Council action could indeed be vetoed by France and by China (Nationalist and later, perhaps inevitably, Communist). Recourse to the Security Council in the event of aggression was called for in any event by the terms of the U.N. Charter; now the superpowers were suggesting that it would come only on behalf of non-nuclear signers of NPT, a shrinkage of guarantees, perhaps, rather than an extension of them.

The question of relations with China brings out the interplay of these arguments quite interestingly. There are persons within India advocating new approaches to China, on the expectation that Peking will become more rational and reasonable after the Great Cultural Revolution has run its course. Such persons, however, also tend to be strong advocates of an Indian bomb program, on the grounds that successful negotiations with a reasonable China must be negotiations among semi-equals, and that at least a nominal nuclear capacity will be required to endow India psychologically with this equality. Any Chinese reversion to greater bellicosity, as for example with new border incidents, or test firing a missile across India into the Bay of Bengal, would also increase pressure within India for a bomb, from a different camp, perhaps for a more costly and serious military program. Hence, the current Chinese posture leaves India with a moderate drift toward nuclear weapons; any change in Peking's demeanor, toward or away from moderation, will accelerate this drift.

PEACEFUL USES

Military uses of nuclear weapons are not essential to India's decision to acquire them, however, any more than Britain's decision to retain them.

Returning to the sphere of economics, it was noted that purely peaceful technology would bring India quite close to bomb capabilities soon enough. The technology of peace and war is not easily separable, and one can even speculate that an Indian decision to "avoid" the bomb would be an obstacle to full research in the peaceful sector. Fissionable material would accumulate naturally over time, as will the knowledge of how to make it explode. Indeed, some of the reluctance on NPT, both within India and outside, comes from the fear that surrendered options, plus international inspection of the surrender, will be inhibiting to scientists.

More concretely, it is impossible to dismiss the possibility that peaceful nuclear explosions will be useful for liberating natural fuel resources deep underground. Indeed, the American Atomic Energy Commission is an important source of optimism in this regard. It is true that the NPT offers countries like India the use of peaceful explosives produced and controlled by one of the nuclear weapons states. Yet, we are trying here to guess whether India will make her own explosives, given the fact that no effective pressure seems at hand to make her accept those of the NPT system. For the moment, on scientific grounds, the guess must be "maybe." One can also conjure up other supposed economic benefits from an Indian bomb program, and the material and psychological "spillover" effects it would have in perking up the Indian economic and scientific community. As with the U.S. space program, such arguments are inherently difficult to evaluate, with all the dangers of double-counting and mis-accounting they present. Indian physicists working for the Indian Atomic Energy program have enough to keep themselves busy for the moment, getting the big new electric power programs into operation. Five years from now, something else might be needed to keep them busy and at home.

BOMBS DO MAKE A DIFFERENCE

Again, India's decision on the bomb will not depend only on material considerations of defense and economic cost. Political prestige is an important consideration in any nuclear weapons

debate, and only the most disingenuous outsiders would deny it.

Few American or Europeans today know that India is capable of making nuclear weapons. Educated persons should be aware of the scientific prowess India has shown, but they are not. It is useless to deny that the explosion of a rudimentary Indian bomb or peaceful explosive would not make editorial writers and citizens all around the world sit up and take notice. The reaction of Afro-Asian countries to the Chinese explosion of 1964 was not one of condemnation, but one of respect.

We have already had suggestions that India be offered some substitute form of prestige, such as permanent membership on the U.N. Security Council, thus presumably removing India's psychological need for the bomb. Yet, this all comes late. The lesson is clearly that if India had not moved this close to a bomb, such suggestions would never have been made. One can conversely ask how much importance the outside world would attach to Communist China today, if she had not entered the nuclear club. Would we not pass off Peking as an internationally insignificant conglomeration of feuding factions, its economic house not in order, greatly overrated as an international actor? Bombs do make a difference.

It is easy to condemn any tendency within India to let something as "childish" as prestige decide the question of the development of weapons of mass destruction. Yet, at least two of the current members of the club have defended their own programs in these terms.

It would be a better world if prestige and respect went to those who had not made weapons, ahead of those who have, but this is not the world in which we or the Indians live.

VIEW OF MILITARY

On a decision on military weapons, one would normally expect the military establishment of a nation to be quite significant. Happily for the tradition of democratic civilian rule in India, these opinions are far from decisive, and are not very openly expressed.

Few generals in any army or air force will deny that they "need" any weapon, or that they could profitably

use it, if it came to them as a free gift. It will thus always be possible to find bomb advocates within the Indian Parliament to assure themselves that the officers of the IAF or Indian Army "would like" to have the bomb. But that the morale of the average Indian footsoldier in the Himalayas would rise if he knew he had nuclear weapons behind him. Yet, there is little evidence of any enthusiasm for nuclear weapons in the Indian Army, or even in the Indian Air Force, on the simple fear that a nuclear weapons program would mushroom into something very costly, drawing funds from conventional weapons which for the moment seem more urgent.

Like military officers everywhere, those of India can not thus be counted upon to oppose the nuclear weapons "arms control" grounds. If a very limited and inexpensive bomb program comes along, their inclination will be to find requirements for it. Only when the budgetary predictions remain open-ended will the military remain a barrier to India's exercise of her option.

THE COMING DECISION

As India and the world move into the 1970s, the nuclear-weapons decision will typically be phrased as a question of monetary cost. For as long as the responsible officials of the central government and Congress party see a nuclear arsenal as involving large expenditures of capital and of foreign exchange, the demands of the opposition benches may yet be ignored, though Indian public-opinion polls now show some 70 per cent of Indians to be "in favor" of an Indian bomb, this does not indicate the response if the price tag in inflated higher taxes were to be clearly defined.

Moving to make the bomb may be a hard decision to make in New Delhi, and hard decisions may be unavoidable. But what if the decision becomes much easier or, conversely, what if it takes a major co-ordinated decision to head off a certain kind of bomb? The attitudes of Indian scientists and bureaucrats at lower levels may be crucial. For if an attractive prospectus is written for an underground peaceful nuclear explosive nation by 1972, it is much less

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phant Teller.

Extensive and open discussion in the scientific community, I believe, will lead to the consensus that military research, or at least the vast proportion of it, is at this time counter-productive. If this is what we believe then, in the present national and international emergency, the most useful and patriotic thing scientists can do is to withhold their talents from the weapons field.

There are, of course, many pressing technical problems whose solution would be of great social benefit: maintaining the integrity of the environment, improving our cities, eliminating hunger and controlling population growth, to mention just a few, not to speak of developing more effective arms-control techniques. And most scientists would much prefer to transfer their efforts to such problems if the resources were made available, preferably by transfer of funds from militarily-oriented projects. Every effort should be made to encourage the commitment of scientists to such socially relevant tasks, and to press for the reallocation of public funds to permit the transfer of research efforts from the military to the civilian sphere. However, the emergency which I have described above is much too acute to wait for such transfer to occur in the natural course of events. With or without the possibility of shifting support, even in the absence of funds for constructive projects, it is necessary for scientists, in concert, to withdraw from projects which are inflaming the arms race.

The effect of such concerted action, even if widespread, will not be to bring military research to a grinding halt; nor would that be the intent. The professionals and the military laboratories will continue their work and, indeed, for some time there will be no perceptible effects. But if I am correct in my analysis of the key innovative role of scientists, and if enough of us agree on the positive virtue and necessity of withholding our talents from the arms race, then, after some time, there will be an effect in that the rate of development of control mechanisms may approach and even exceed the rate of introduction of destabilizing new arms developments.

I am not here simply referring to the conventional concept of "the social

responsibility of scientists"; that, at least to me, implies the individual decision made by each scientist on the basis of his conscience. This is a powerful mechanism and will continue to exert strong pressures for the benign and humanist-oriented application of science and technology. But, and this is my main contention, individual action is not enough in the present crisis. What is needed is group action, such as that which led to the Manhattan Project and that which defeated the May-Johnson Bill. And, in this case, the group action that is needed parallels the aforementioned examples: the creation of imaginative projects for the solution of pressing social problems, and the agreement on "group inaction" on projects for the development of new military technology.

INDIA AND THE BOMB

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that the center will dare or want to reject it.

Atomic energy is a field in which Indians rightly take pride, it is a field in which scientific morale is high. For India to lose its momentum in atomic energy now would almost be to violate a sacred trust. The morale of Indian physicists is high, in part because they have been exempted from some of the bureaucratic nuisances that too often show up in India, and in part because they are engaged in some big projects that are showing clear progress. The two go together.

When the big reactors are in operation in Rajasthan, when construction of the newer ones in Madras is well under way, it may seem important for the Indian atomic energy community to move on to something else that is big and productive and exempt from bureaucratic red tape. The nuclear explosive clearly is one project that fits this description.

A project for a "peaceful" nuclear explosion (to avoid seeming bellicose), underground (to avoid violating the test-ban treaty which India did sign), with plutonium as the fissile material (to avoid great expenditures), would probably encounter very little resistance at the center. Among the Indian public officials who were known to be

opponents of nuclear weapons in 1968, almost none were prepared to rule out peaceful explosive devices along with explicit weapons. Some persons drawing this distinction may quite sincerely see a major demarcation line here. Hope is even attached to the possibility that such devices would be physically different from weapons, although few scientists anywhere would reinforce such hopes.

Many other Indians talking about "peaceful explosives" know quite well, however, that these are functionally usable as bombs, and that every editorial writer from New York to Tokyo will immediately note this overlap. In truth, such Indians welcome the overlap, for it would allow India to join the club behind a euphemism, avoiding too brazen an affront to the international community, and behind a civilian economic rationale that may suffice to push the project through domestically.

If economic costs are thus not excessive, if bureaucratic momentum is not too difficult to generate, the "peaceful bomb" indeed offers dividends to the Congress party, making serious resistance from Delhi all the less likely. It has been said that public opinion on Indian nuclear weapons is not to be taken seriously, since few votes are ever won or lost in India on foreign policy questions. But this is only partially true. To mobilize the individual party workers necessary to keep the Congress party viable as a national party, Congress needs a national focus, to distinguish it from all that is communal and particularist and regional in India.

If foreign policy supplies the necessary unifying focus, elite views on foreign policy can not be ignored, regardless of what directly inspires the masses of voters. India faces a national election in 1972. If the economy can be kept in order, if food supplies remain adequate, the addition of a major Indian scientific (and military) accomplishment in late 1971 would substantially enhance the stature of the ruling party, and there has been discussion of this within the Congress party. If the scientists by then have written up an underground explosion to make it look appropriate in non-political terms, who in the Indian political world will try to deny it to them?